

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA20 | Curdworth to Middleton

Operational assessment (SV-004-020)

Sound, noise and vibration

November 2013

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Appendix SV-004-020

Environmental topic:	Sound, noise and vibration	SV
Appendix name:	Operation assessment	004
Community forum area:	Curdworth to Middleton	020

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1 Introduction

1.1 Structure of the sound, noise and vibration appendices

1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these details the methodology used (Appendix SV-001-000) and relates to the sound, noise and vibration assessment for all community forum areas (CFA).

1.1.2 For the Curdworth to Middleton community forum area (CFA20), the other three sections are as follows:

- baseline sound, noise and vibration (Appendix SV-002-020);
- construction sound, noise and vibration (Appendix SV-003-020); and
- operational sound, noise and vibration (Appendix SV-004-020 (this appendix)).

1.1.3 The outcomes of this assessment are summarised in Volume 2: CFA20 Report, Chapter 11 Sound, Noise and Vibration.

1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 sound, noise and vibration map book.

1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the operation of the Proposed Scheme for the Curdworth to Middleton area on:

- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community spaces; and
- community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.

1.1.6 The assessment of likely impacts, effects and significant effects from operational noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:

- Agriculture, forestry and soils Appendix AG-001-020
- Community Appendix CM-001-020
- Ecology Appendix EC-005-003
- Heritage Appendix CH-003-020
- Landscape and Visual Appendix LV-001-020

1.2 Evaluation of impacts and effects

1.2.1 This appendix provides a quantitative assessment of operational noise and vibration impacts and effects and a qualitative assessment of likely significant effects, based on the impacts and effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.

- 1.2.2 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5 Appendix SV-001-000.
- 1.2.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3.
- 1.2.4 Off-route effects of noise or vibration arising from the operation of the Proposed Scheme, including those likely to arise from permanent changes in traffic patterns on roads or railways outside of the study area for direct effects are reported in Volume 4.
- 1.2.5 In undertaking the assessment of sound, noise and vibration, consistent with EIA Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV001-000.
- 1.2.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-02 in the CFA20 Volume 5 sound, noise and vibration map book.

¹ National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>; refer to the table summarising noise exposure hierarchy

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group (Acoustics), information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The North Warwickshire Local Plan - July 2006.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5, particularly Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1, Section 8.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration
- September / October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January / February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written response to questions on sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

2.4.1 Route-wide assumptions are outlined in Volume 1, Section 8, and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of operational sound noise and vibration within this CFA are set out in Volume 2: Report 20.

2.5 Local limitations

2.5.1 In this area, there are a number of locations where the land or property owners did not permit baseline sound level monitoring to be undertaken at their premises. However, sufficient information has been obtained to undertake the assessment. Further information is provided in Volume 5: Appendix SV-002-020.

3 Environmental baseline

3.1 Existing baseline

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are included within Table 3. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-020.
- 3.1.2 The majority of receptors adjacent to the line of the route are not currently subject to appreciable vibration and therefore vibration at all receptors has been assessed using the absolute vibration criteria as described in Volume 5: Appendix SV-001-000.

3.2 Future baseline

- 3.2.1 The assessment is based upon the predicted change in sound levels that result from the Proposed Scheme. The assessment initially considered a worst case (that would overestimate the change in levels) by assuming that sound levels would not change from the existing baseline year of 2012/2013. Where significant effects were identified on this basis, the effects have been assessed using the baseline year of 2026 to coincide with the proposed start of passenger services. The future baseline is for the sound environment that would exist in 2026 without the Proposed Scheme.

4 Effects arising during operation

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - Residential
 - Non-residential
 - Airborne sound
 - Residential
 - Non-residential
- Assessment of impacts and effects
 - Residential receptors: direct effects – dwellings
 - Residential receptors: direct effects – communities
 - Residential receptors: indirect effects
 - Non-residential receptors: direct effects
 - Non-residential receptors: indirect effects
 - Cumulative effects from the proposed scheme and other committed development.

4.2 Avoidance and mitigation measures

4.2.1 These are set out in Volume 2: Report 20.

4.3 Quantitative identification of impacts and effects

Ground-borne noise and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA20 Volume 5 sound, noise and vibration map book.

4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in Table 1 is provided in Appendix SV-001-000, with the following additional notes.

B	For non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
NA	Type of effect - Generally no adverse effect
A	Type of effect - Adverse effect
S	Type of effect - Significant adverse effect
VDV	Vibration Dose Value
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
^	The impact methodology has identified a potential significant effect at this receptor which based upon further qualitative information is not considered to be a likely significant effect. Please refer the end of this Appendix for further information.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact

Table 1: Ground-borne sound and vibration levels, noise and vibration impacts and effects

Assessment location		Impact criteria				Significance criteria							Significant effect
		Ground-borne sound level dB L _{pASmax}	VDV m/s ^{1.75} Daytime (07:00 - 23:00)	VDV m/s ^{1.75} Night time (23:00 - 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	
ID	Area represented												
131532	Marston Lane, Curdworth	-	0.00	0.00	-	1	NA	R	T	-	-	-	-
153252	Newlands Lane, Curdworth	-	0.38	0.19	-	2	A	R	T	-	-	Y	-
153759	Kingsbury Road, Curdworth	-	0.07	0.04	-	1	NA	R	T	-	-	-	-
153895	Lock House Lane, Curdworth	-	0.00	0.00	-	1	NA	R	T	-	-	-	-
711047	Tamworth Road, Middleton	-	0.06	0.03	-	1	NA	R	T	-	-	-	-
131532	Dunton Stables	-	0.00	0.00	-	1	B	G4/V3	T	-	-	-	-
153646	Dunton Hall, Kingsbury Road, Curdworth, (General Commercial)	-	0.00	0.00	-	1	B	G4/V3	T	-	-	-	-

Impact summary

4.3.3 The operational ground-borne noise and vibration impacts identified in Table 1 are summarised in Table 2.

Table 2: Summary of operational ground-borne noise and vibration impacts

	Number of ground-borne noise impacts			
	Low	Medium	High	Very High
Residential properties	0	0	0	0
Non-residential properties	0			0
	Number of ground-borne vibration impacts			
	Minor	Moderate	Major	Risk of building damage
Residential properties	2	0	0	0

Airborne sound: direct impacts and effects

4.3.4 The direct effects from the operation of the Proposed Scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the scheme, are presented in Table 3.

4.3.5 The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation case at residential and non-residential receptors are presented in Table 3. The results should be considered in conjunction with the information contained in map series Sv-02 in the CFA20 Volume 5 sound, noise and vibration map book.

4.3.6 Explanation of the Table 3 information is provided in Appendix SV001-000, with the following additional notes.



Where the significant effect column is marked, then a significant effect is identified at the referenced group of dwellings, or individual residential or non-residential receptor.

Yellow denotes a minor impact at a residential building – a change is of 3-5 dB

Orange denotes a moderate impact at a residential building – a change is of 5-10 dB

Red denotes a major impact at a residential building – a change is of >10 dB

* Day - $L_{pAeq,07:00-23:00}$

** Night - $L_{pAeq,23:00-07:00}$

*** Max - L_{pAFmax} In the Proposed Scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.

**** Where the Proposed Scheme modifies an existing source, i.e. road or railway realignments, the *Proposed Scheme only* level in the table includes the sound from the modified source. In this situation the *Do something (Opening year baseline + Year 15 traffic)* level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

A Adverse effect

B For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000.

CD Committed Development. The value in brackets in the number of impacts represented column is the value with the committed development.

- G (G1)Theatres, large auditoria and concert halls, (G2) Sound recording and broadcast studios, (G3) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) Schools, colleges, hospitals, hotels and libraries, and (G5) Offices and general commercial premises
- H High existing ambient sound level. Defined as $>65\text{dB}\text{L}_{\text{Aeq, day}}$ and/or $>55\text{dB}\text{L}_{\text{Aeq, night}}$
- L Low existing ambient sound level. Defined as $<42\text{dB}\text{L}_{\text{Aeq, day}}$ and/or $<32\text{dB}\text{L}_{\text{Aeq, night}}$
- LD Landscape receptor
- NA Generally no adverse effect
- NI The receptor is predicted to qualify for mitigation, which shall be provided to the specification defined in the Noise Insulation (Railways and other Guided Rail Systems) Regulations 1996
- R Residential
- RM Residential mooring
- S Significant adverse effect
- U Unacceptable adverse effect
- # A change of 3dB or greater has been identified however, the assessment methodology only defines an impact where the absolute sound level from the Proposed Scheme is greater or equal to 50 dB $\text{L}_{\text{pAeq, 23:00 - 07:00}}$ during the daytime or 40 dB $\text{L}_{\text{pAeq, 07:00 - 23:00}}$ at night. At the receptor denoted the absolute level condition is not met and therefore no impact is identified.
 - ~ The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)..
 - \$ A change of 3dB or greater has been identified however, the impact methodology for non-residential receptors includes a screening criteria for G3 building use of 50 dB $\text{L}_{\text{pAeq,07:00-23:00}}$, for G4 building use 55 dB $\text{L}_{\text{pAeq,07:00-23:00}}$ and 45 dB $\text{L}_{\text{pAeq,23:00-07:00}}$, for G5 building use 55 dB $\text{L}_{\text{pAeq,07:00-23:00}}$. At the receptor denoted the screening criteria is not met and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-000.
 - ^ The impact methodology has either identified an impact at a receptor which based upon further qualitative information does not give rise to a significant effect. Further information is provided at the end of this Appendix.

Table 3: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria						Significant effect	
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **								
131149	Canalside, Curdworth	42	34	53/56	54	53	55	54	53	0	0	A	2	R	T	-	-	-	
131403	Farthing Lane, Curdworth	45	36	61/64	59	57	62	59	57	0	0	A	1	R	T	H	-	-	-
131532	Marston Lane, Curdworth	67	57	87/90	69	61	71	71	62	2	2	S	1	R	T	H	-	-	NI OSV20-Do3
148264	Farthing Lane, Curdworth	41	32	56/58	59	57	62	59	57	0	0	A	8	R	T	H	-	-	-
148284	Farthing Lane, Curdworth	43	33	61/64	59	57	62	59	57	0	0	A	7	R	T	H	-	-	-
148328	Farthing Lane, Curdworth	44	35	61/64	59	57	62	59	57	0	0	A	8	R	T	H	-	-	-
148810	Coleshill Road, Curdworth	45	36	60/63	58	55	69	58	55	0	0	A	1	R	T	H	-	-	-
148843	Marsh Lane, Curdworth	50	41	65/68	63	60	74	63	60	0	0	A	2	R	T	H	-	-	-
148867	Marsh Lane, Curdworth	53	44	70/72	63	60	74	63	60	0	0	A	1	R	T	H	-	-	-
148957	Farthing Lane, Curdworth	43	34	60/63	55	54	56	55	54	0	0	A	1	R	T	-	-	-	-
149112	Lichfield Road, Curdworth	50	42	64/67	63	60	74	63	60	0	0	A	1	R	T	H	-	-	-
149175	Tamworth Road, Wishaw	47	37	65/68	65	57	61	65	57	0	0	A	3	R	T	H	-	-	-
153252	Newlands Lane, Curdworth	72	63	89/92	60	57	64	72	63	12	6	S	2	R	T	H	-	Y	NI OSV20-Do1
153646	Kingsbury Road, Curdworth	63	53	90/92	58	54	64	64	57	6	2	S	1	R	T	-	-	-	NI OSV20-Do2
153754	Kingsbury Road, Curdworth	54	45	64/67	53	53	60	55	53	2	0	A	1	R	T	-	-	-	-
153809	Blackgreaves Lane, Lea Marston	51	43	65/68	53	53	60	55	53	1	0	A	8	R	T	-	-	-	-
153857	Kingsbury Road, Marston	51	41	67/70	64	59	79	64	59	0	0	A	1	R	T	H	-	-	-
153874	Kingsbury Road, Marston	55	45	71/74	67	62	85	67	62	0	0	A	3	R	T	H	-	-	-
153895	Lock House Lane, Curdworth	64	55	82/85	72	64	71	72	64	1	0	S	1	R	T	H	-	-	NI OSV20-Do5

Assessment Location			Impact criteria										Significance criteria					Significant effect		
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
154354	Church Lane, Middleton	45	36	59/62	50	49	51	51	49	1	0	A	8	R	T	-	-	-	-	
154882	Bodymoor Heath Lane, Bodymoor Heath	54	45	68/71	60	52	71	61	53	1	1	A	3	R	T	-	-	-	-	
156042	Vicarage Hill, Middleton	43	36	61/63	38	34	38	43	36	6	3	A	3	R	T	L	-	-	#	
156159	Church Lane, Middleton	47	38	63/66	57	44	47	60	45	2	1	A	4	R	T	-	-	-	-	
156221	Church Lane, Middleton	46	37	60/63	52	47	49	53	47	1	0	A	8	R	T	-	-	-	-	
156249	Church Lane, Middleton	46	38	61/63	44	40	44	46	41	3	1	A	1	R	T	-	-	-	#	
156460	Coppice Lane, Middleton	43	35	59/61	52	47	49	53	47	0	0	A	8	R	T	-	-	-	-	
156490	Coppice Lane, Middleton	46	37	60/63	52	47	49	53	47	1	0	A	8	R	T	-	-	-	-	
156581	Simmons Close, Middleton	46	37	60/63	52	47	49	60	45	8	-2	A	14	R	T	-	-	-	#	
156612	Church Lane, Middleton	47	38	62/65	49	44	49	60	45	10	1	A	3	R	T	-	-	-	#	
156642	Church Lane, Middleton	45	37	59/62	50	49	51	51	49	1	0	A	5	R	T	-	-	-	-	
156675	Church Lane, Middleton	46	37	60/62	52	47	49	53	47	1	0	A	3	R	T	-	-	-	-	
156682	Church Lane, Middleton	46	38	62/64	60	47	47	60	48	0	1	A	3	R	T	-	-	-	-	
156781	Coppice Lane, Middleton	49	40	66/68	43	32	49	50	40	7	8	A	1	R	T	L	-	-	~	
157025	Tamworth Road, Wishaw	51	41	65/68	67	63	82	67	63	0	0	A	3	R	T	H	-	-	-	
157038	The Belfry, Lichfield Road, Wishaw, (Office)	47	38	64/67	67	63	82	67	63	0	0	A	1	R	T	H	-	-	-	
157129	Wishaw Lane, Middleton	48	40	59/62	50	42	50	51	43	1	0	A	3	R	T	-	-	-	-	
157219	Brick Kiln Lane, Middleton	56	48	68/71	67	63	82	67	62	0	0	A	1	R	T	H	-	-	-	
157233	Tamworth Road, Middleton	61	52	75/78	72	68	87	72	68	0	0	A	1	R	T	H	-	-	-	
157272	Wishaw Lane, Middleton	49	41	62/65	48	40	46	49	41	2	1	A	1	R	T	-	-	-	-	

Assessment Location			Impact criteria										Significance criteria						Significant effect	
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day * **	Night **	Max ***	Day * **	Night **	Max ***	Day * **	Night **	Day * **	Night **									
157376	Wishaw Lane, Middleton	52	44	63/66	52	44	54	54	45	2	1	A	1	R	T	-	-	-	-	
157403	Wishaw Lane, Middleton	50	42	61/64	50	42	50	50	42	1	0	A	4	R	T	-	-	-	-	
157437	Wishaw Lane, Middleton	47	39	58/61	45	37	45	47	39	2	2	A	1	R	T	-	-	-	-	
157444	Wishaw Lane, Middleton	51	43	62/65	50	42	50	51	43	1	1	A	3	R	T	-	-	-	-	
157480	Church Lane, Middleton	48	39	63/65	49	44	49	60	45	11	1	A	8	R	T	-	-	-	-	#
157513	Church Lane, Middleton	50	42	67/70	60	47	47	63	48	2	1	A	4	R	T	-	-	-	-	
157552	Church Lane, Middleton	48	39	66/68	60	47	47	63	47	2	0	A	8	R	T	-	-	-	-	
157573	Church Lane, Middleton	51	43	67/69	60	47	47	63	48	2	1	A	7	R	T	-	-	-	-	
157603	Church Lane, Middleton	50	40	69/72	50	47	47	53	47	3	0	A	5	R	T	-	-	-	-	~
157635	Tamworth Road, Middleton	51	42	70/73	64	60	62	64	60	0	0	A	2	R	T	H	-	-	-	
157725	Crowberry Lane, Middleton	50	42	70/72	41	37	44	50	42	10	5	A	1	R	T	L	-	-	-	~
158064	Bodymoor Heath Lane, Bodymoor Heath	51	42	64/67	60	52	71	60	53	1	0	A	1	R	T	-	-	-	-	
158102	Bodymoor Heath Lane, Bodymoor Heath	51	41	64/67	62	54	70	62	55	0	0	A	4	R	T	-	-	-	-	
158180	Bodymoor Heath Lane, Bodymoor Heath	53	44	68/71	50	52	73	55	53	5	1	A	2	R	T	-	-	-	-	~
158206	Bodymoor Heath Lane, Bodymoor Heath	48	38	62/65	65	57	76	65	57	0	0	A	4	R	T	H	-	-	-	
158314	Bodymoor Heath Lane, Kingsbury	51	42	66/69	54	56	77	56	56	2	0	A	5	R	T	H	-	-	-	
158349	Bodymoor Heath Lane, Middleton	63	54	77/80	57	53	72	63	56	6	3	A	1	R	T	-	-	-	-	~

Assessment Location			Impact criteria										Significance criteria						Significant effect	
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day * **	Night **	Max ***	Day * **	Night **	Max ***	Day * **	Night **	Day * **	Night **									
158471	Middleton, Tamworth	51	43	62/65	54	50	52	55	51	1	0	A	2	R	T	-	-	-	-	
190438	Hams Lane, Lea Marston	42	34	49/51	56	56	62	56	56	0	0	A	2	R	T	H	-	-	-	
191067	Haunch Lane, Lea Marston	44	36	57/60	53	53	60	54	53	0	0	A	4	R	T	-	-	-	-	
700645	Church Lane, Middleton	42	34	55/58	50	49	51	51	49	1	0	A	1	R	T	-	-	-	-	
711045	Kingsbury Road, Curdworth	61	51	75/78	58	54	64	63	56	5	2	A	1	R	T	-	-	-	-	~
711047	Middleton House Farm	66	56	85/88	57	53	72	66	58	9	5	S	1	R	T	-	-	-	NI	OSV20-Do4
131403	Curdworth Primary School, (Primary School)	45	36	61/64	59	57	62	59	57	0	0	B	1	G4	T	H	-	-	-	
131532	Dunton Stables (Stables)	67	57	87/90	69	61	71	71	62	2	2	B	1	G5	T	H	-	-	-	
149112	Dunton Wharf, Lichfield Road, (General Commercial)	50	42	64/67	63	60	74	63	60	0	0	B	1	G5	T	H	-	-	-	
149112	Wishaw Lane, Curdworth, (General Commercial)	50	42	64/67	63	60	74	63	60	0	0	B	1	G5	T	H	-	-	-	
152897	Hams Hall National Distribution Park, Canton Lane (General Commercial)	51	42	64/67	69	66	85	69	66	0	0	B	7	G5	T	H	-	-	-	
153153	Edison Road, Hams Hall (General Commercial)	56	47	74/77	59	56	60	60	56	2	0	B	1	G5	T	H	-	-	-	
153646	Dunton Hall, Kingsbury Road, (Veterinary Clinic)	63	53	90/92	58	54	64	64	57	6	2	B	1	G5	T	-	-	-	-	OSV20-No1
153754	Kingsbury Road, Curdworth, (General Commercial)	54	45	64/67	53	53	60	55	53	2	0	B	1	G5	T	-	-	-	-	
154354	Church Lane, Middleton, (Shopping)	45	36	59/62	50	49	51	51	49	1	0	B	1	G5	T	-	-	-	-	

Assessment Location			Impact criteria										Significance criteria					Significant effect		
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
156042	Vicarage Hill Farm, Vicarage Hill (Equestrian Training)	43	36	61/63	38	34	38	43	36	6	3	B	1	G4	T	L	-	-	\$	
156675	Middleton Recreation Room, Church Lane, Middleton, (Hall)	46	37	60/62	52	47	49	53	47	1	0	B	1	G3	T	-	-	-		
156781	Upper House Farm, Coppice Lane, Middleton, (Office)	49	40	66/68	43	32	49	50	40	7	8	B	1	G5	T	L	-	-	\$	
157038	The Belfry, Lichfield Road, Wishaw (Office)	47	38	64/67	67	63	82	67	63	0	0	B	2	G5	T	H	-	-		
158003	Marston Farm Hotel, Dog Lane, Bodymoor Heath (Hotel)	54	45	68/71	61	63	85	62	63	1	0	B	1	G4	T	H	-	-		
158471	Middleton (Office)	51	43	62/65	54	50	52	55	51	1	0	B	1	G5	T	-	-	-		
191067	Haunch Lane, Lea Marston, (Hotel)	44	36	57/60	53	53	60	54	53	0	0	B	1	G4	T	-	-	-		
700643	St. John The Baptist Church, Middleton (Church)	45	36	58/60	52	47	49	53	47	1	0	B	1	G3	T	-	-	-		
700645	Green Man Inn, Church Lane, Middleton (Inn)	42	34	55/58	50	49	51	51	49	1	0	B	1	G5	T	-	-	-		

Direct impact - Summary

4.3.7 The operational airborne noise impacts identified in Table 3 are summarised in Table 4.

Table 4: Summary of operational airborne sound impacts

Receptor	Number of impacts		
	Minor	Moderate	Major
Residential properties	5	7	3
Non-residential properties	0	1	0
Quiet areas	None	None	None

4.4 Assessment of impacts and effects

Residential receptors: direct effects - individual buildings

4.4.1 Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified a number of residential dwellings, close to the Proposed Scheme, where noise would exceed the daytime trigger threshold set forth in the Regulations. It is therefore estimated that these buildings are likely to qualify for noise insulation under the Regulations. These dwellings include the following and are indicated on Volume 5: Map Book – Sound, noise and vibration, Map series SV-02:

- Orchard Bungalow and Newlands Farm, Newlands Lane, Curdworth, receptor reference 153252 (marked as OSV20-Do1 in Table 3); and
- The Bungalow, Middleton Farm, Tamworth Road, Middleton, receptor reference 711047 (marked as OSV20-Do4 in Table 3).

4.4.2 The assessment has identified three additional residential buildings close to the Proposed Scheme, Dunton Hall and Dunton Stables off Kingsbury Road, Curdworth, and 254 Lock House Lane, Curdworth, represented by receptors 153252, 153646 and 153895 (marked as OSV20-Do2, OSV20-Do3 and OSV20-Do5 in Table 3); where the daytime forecast noise level does not exceed the threshold set in the Regulations but the forecast night-time noise level would exceed the World Health Organization's Interim Target of 55dB², or the maximum noise level (dependent on the number of train passes) as a train passes exceeds the criterion³. It is estimated that these buildings will also be offered noise insulation as described previously in the Avoidance and mitigation measures section. These are also identified as being likely to qualify for noise insulation as a consequence of construction noise as described earlier in this section. These buildings are indicated on Volume 5: Map Book - Sound, noise and vibration, Map series SV-02.

² World Health Organization (2010), *Night-time Noise Guidelines for Europe*.

³ During the night (2300-0700) a significant effect is also identified where the Proposed Scheme results in a maximum sound level at the façade of a building at or above: 85dB L_{pAFmax} (where the number of train pass-bys exceeding this value is less than or equal to 20); or 80dB L_{pAFmax} (where the number of train pass-bys exceeding this value is greater than 20).

4.4.3 The mitigation measures including noise insulation will reduce noise inside all dwellings such that it will not reach a level where it would significantly affect residents.

Residential receptors: direct effects –communities

4.4.4 Mitigation measures in this area will avoid airborne noise adverse effects on the majority of receptors, and at the following residential communities:

- Middleton;
- Hunts Green; and
- Curdworth.

4.4.5 Taking account of the envisaged mitigation, Volume 5: CFA20 Map Book, Map Series SV-02 shows the long term 40dB⁴ night-time sound level contour from the operation of trains on the Proposed Scheme. The extent of the 40dB night-time sound level contour is equivalent to, or slightly larger than, the 50dB daytime contour⁵. In general, below these levels adverse effects are not expected.

4.4.6 Above 40dB during the night and 50dB during the day the effect of noise is dependent on the baseline sound levels and the change in sound level (magnitude of effect) brought about by the Proposed Scheme. The airborne noise impacts and effects forecast for the operation of the Proposed Scheme are presented on Volume 5: CFA20 Map Book, Map Series SV-02

4.4.7 The changes in noise levels are likely to affect the acoustic character of the area such that there is a perceived change in the quality of life and can be considered to be significant when assessed on a community basis⁶ taking account of the local context.

4.4.8 Two isolated properties within the area have been identified as being subject to an observed adverse vibration effect these effects are likely to be considered as an effect on the acoustic character of the area such that there is a perceived change in the quality of life. However, as the affected properties are spatially remote from larger defined residential areas, are subject to smaller magnitudes of vibration effect, or are small in number, the effects are not considered to be significant.

4.4.9 Approximately 10 isolated properties within the area have been identified as being subject to an observed adverse noise effect; these effects are likely to be considered as an effect on the acoustic character of the area such that there is a perceived change in the quality of life. However, as the affected properties are spatially remote from larger defined residential areas, are subject to smaller magnitudes of noise effect, or are small in number, the effects are not considered to be significant.

⁴ Defined as the equivalent continuous sound level from 23:00 to 07:00 or $L_{pAeq,night}$.

⁵ With the train flows described in the assumptions section of this CFA Report, the daytime sound level (defined as the equivalent continuous sound level from 07:00 to 23:00 or $L_{pAeq,day}$) from the Proposed Scheme would be approximately 10dB higher than the night-time sound level. The 40dB contour therefore indicates the distance from the Proposed Scheme at which the daytime sound level would be 50dB.

⁶ Further information is contained in Volume 1.

11.1.1 As a result of the avoidance and mitigation measures included within the Proposed Scheme, the assessment has not identified any adverse effects that are considered to be significant on a community basis in this area.

Residential receptors: indirect effects

4.4.10 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.

4.4.11 The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

Non-residential receptors: direct effects

4.4.12 The assessment has identified airborne noise impacts at Dunton Hall veterinary clinic and Middleton House Farm bed and breakfast accommodation represented by receptor reference 5153646 and 711047.

Dunton Hall - veterinary clinic

4.4.13 A moderate operational noise impact has been identified based upon the change in the airborne noise level outside this receptor, reference 153646. An assessment has been undertaken to determine if this impact would result in a likely significant effect at this non-residential receptor, using the significance criteria detailed in Volume 5: Appendix 001-000.

4.4.14 The Dunton Hall veterinary clinic is located within a building adjacent to Dunton Hall. The building is constructed of Brick and tiled roof, and single glazed windows, which it is assumed are opened to provide ventilation.

4.4.15 Dunton Hall veterinary clinic is identified, on a precautionary basis, as being subject to a significant adverse effect denoted by OSV20-No1 in Table 3 and drawing SV-02 (see CFA20 Volume 5 sound, noise and vibration map book). This may take the form of the activity disturbance to the people using the clinic.

Middleton House Farm

4.4.16 A moderate operational noise impact has been identified based upon the change in the airborne noise level outside this receptor, reference 711047. An assessment has been undertaken to determine if this impact would result in a likely significant effect at this non-residential receptor, using the significance criteria detailed in Volume 5: Appendix 001-000.

4.4.17 The temporary residential accommodation is located within a building adjacent to the residential area of the farm. The buildings are constructed of brick, tiled roofs and single glazed windows which, it is assumed, are opened to provide ventilation.

4.4.18 Middleton House Farm is identified, on a precautionary basis, as being subject to a significant adverse effect denoted by OSV20-No2 in Table 3 and drawing SV-02 (see CFA20 Volume 5 sound, noise and vibration map book). This may take the form of the activity disturbance to the people using the accommodation.

Summary

4.4.19 The assessment of operational noise and vibration indicates that significant effects are likely on the non-residential receptors identified in Table 5.

4.4.20 The assessment of direct effects on non-residential receptors has been undertaken on a reasonable worst case basis taking account of publicly available information about each receptor. Further information can be found in Volume 5: Appendix SV-004-020.

Table 5: Likely significant noise or vibration effects on non-residential receptors arising from operation of the Proposed Scheme

Significant effect number (see Map series SV-02 Table 1 and 3)	Type of significant effect and source	Time of day	Location and details
OSV20-No1	Adverse effect on the acoustic character around the buildings and on a worst case basis there is a risk of disturbing activities inside the buildings due to the operation of train services.	Daytime	Commercial buildings (related to a veterinary practice) located at Dunton Hall, Curdworth
OSV20-No2	Adverse effect on the acoustic character around the buildings and on a worst case basis there is a risk of disturbing activities inside the buildings due to the operation of train services.	Daytime and night time	Middleton House Farm bed and breakfast

Non-residential receptors: indirect effects

4.4.21 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.

4.4.22 The assessment of operational noise and vibration indicates that significant indirect effects are unlikely to occur on non-residential receptors in this area.

Cumulative effects

4.4.23 Details of properties being currently developed which were afforded planning approval before the safeguarding date are presented in Volume 5: Appendix CToo4-ooo. Within this area, the operational sound, noise or vibration associated with these developments in conjunction with the operation of the Proposed Scheme do not result in any significant cumulative effects.